What is claimed is:

1. An isolated myeloid cell and progenitors and progeny thereof, wherein the cell expresses CD11b, wherein the cell does not express MHC Class II, and wherein the cell expresses low levels of or does not express CD11c.

2. The isolated myeloid cell of Claim 1, wherein the cell expresses F4/80.

3. The isolated myeloid cell of Claim 1, wherein the cell expresses CD68.

4. The isolated myeloid cell of Claim 1, wherein the cell expresses CCR3.

5. The isolated myeloid cell of Claim 1, wherein the cell expresses B220.

6. The isolated myeloid cell of Claim 1, wherein the cell does not stain with vital red stain.

7. The isolated myeloid cell of Claim 1, wherein the cell does not express CD86.

8. The isolated myeloid cell of Claim 1, wherein the cell does not express a T cell receptor (TcR) or a surface immunoglobulin.

9. The isolated myeloid cell of Claim 1, wherein the cell is a murine cell and wherein the cell expresses Gr1.

10. The isolated myeloid cell of Claim 1, wherein the cell is a human cell and wherein the cell expresses the human homologue of murine Gr1.

11. The isolated myeloid cell of Claim 1, wherein the cell, when activated, mediates an immune response.

12. The isolated myeloid cell of Claim 1, wherein the cell, when activated, mediates an immune response associated with IL-4 production.

13. The isolated myeloid cell of Claim 1, wherein the isolated myeloid cell, when activated, mediates priming of B cells for MHC class II signaling.

14. The isolated myeloid cell of Claim 1, wherein the cell mediates thymus-dependent B cell expansion.

15. The isolated myeloid cell of Claim 1, wherein the cell mediates thymus-dependent antibody production by B cells.

16. The isolated myeloid cell of Claim 1, wherein the isolated myeloid cell is activated by an aluminum-based salt adjuvant.

17. The isolated myeloid cell of Claim 1, wherein the isolated myeloid cell is activated by granulocyte-macrophage colony-stimulating factor (GM-CSF).

18. The isolated myeloid cell of Claim 1, wherein the cell is derived from a cell isolated from bone marrow that has been exposed to granulocyte-macrophage colony-stimulating factor (GM-CSF).

19. The isolated myeloid cell of Claim 1, wherein the cell is derived from a cell isolated from bone marrow that has been contacted with an aluminum-based salt adjuvant.

20. The isolated myeloid cell of Claim 1, wherein the cell has been immortalized.

21. An isolated population of cells enriched for the isolated myeloid cell or progenitors or progeny thereof of Claim 1.

22. The isolated population of cell of Claim 22, wherein the population is a clonal population consisting essentially of the myeloid cell and progeny thereof of Claim 1.

23. The isolated population of cells of Claim 22, wherein the population of cells is produced by:

a) isolating cells from a source selected from the group consisting of: bone marrow, hematopoietic precursor cells, adult stem cells, fetal stem cells, spleen cells, peripheral blood cells and embryonic stem cells;

b) exposing the cells to an agent selected from the group consisting of an aluminum-based salt adjuvant and GM-CSF, or a derivative thereof;

c) isolating cells from step (b) that have the following cell surface phenotype: $CD11b^{+}$, $CD11c^{-/low}$, MHC Class $^{II-}$.

24. The isolated population of cells of Claim 22, wherein the population of cells is produced by:

a) immunizing an animal with a composition comprising an aluminum-based salt adjuvant or a derivative thereof;

b) isolating cells from step (a) that have the following cell surface phenotype: $CD11b^{+}$, $CD11c^{-/low}$, MHC Class $^{II-}$.

25. A vaccine comprising the isolated myeloid cell or its progenitor of Claim 1 and at least one antigen.

26. The vaccine of Claim 25, wherein the antigen is selected from the group consisting of: a viral antigen, a mammalian cell surface molecule, a bacterial antigen, a fungal antigen, a protozoan antigen, a helminth antigen, an ectoparasite antigen, and a cancer antigen.

27. A vaccine comprising the isolated myeloid cell or its progenitor of Claim 1 and a cytokine.

28. A method for enhancing a thymus-dependent immune response, comprising:

a) isolating the myeloid cell or its progenitor of Claim 1 from a patient;

b) activating the cell *ex vivo*; and

c) administering the cell after step (b) to the patient.

29. The method of Claim 28, wherein step (c) further comprises administering an antigen to the patient.

30. The method of Claim 28, wherein step (b) comprises exposing the cell to an agent selected from the group consisting of an aluminum-based salt adjuvant and GM-CSF.

31. The method of Claim 28, wherein the myeloid cell in (a) is isolated from the bone marrow, the spleen, or the peripheral blood of the patient.

32. A method for enhancing a thymus-dependent immune response, comprising:

a) providing a myeloid cell or its progenitor according to Claim 1;

b) activating the cell *ex vivo*; and

c) administering the cell after step (b) to the patient.

33. The method of Claim 32, wherein step (c) further comprises administering an antigen to the patient.

34. The method of Claim 32, wherein step (b) comprises exposing the cell to an agent selected from the group consisting of an aluminum-based salt adjuvant and GM-CSF.

35. A method to produce a myeloid cell that mediates thymus-dependent immune responses, comprising:

a) isolating cells from the bone marrow, spleen or peripheral blood of an animal;

b) exposing the cells to an agent selected from the group consisting of an aluminum-based salt adjuvant and GM-CSF, or a derivative thereof; and

c) selecting cells from (b) that have the following cell surface phenotype: $CD11b^{+}$, $CD11c^{-/low}$, MHC Class $^{II-}$.

36. The method of Claim 35, wherein the agent in step (b) is selected from the group consisting of an aluminum-based salt adjuvant and GM-CSF.

37. A method to identify agents that enhance thymus-dependent immune responses, comprising:

a) exposing a source of myeloid progenitor cells to a test agent;

b) detecting whether cells from (a) that, after exposure to the test adjuvant, comprise cells having the following phenotype: $CD11b^{+}$, $CD11c^{-/low}$, MHC Class $^{II-}$; and

c) determining whether cells detected in (b), when contacted with naive B cells, mediate priming of B cells for MHC class II signaling;

wherein an induction or increase in priming of B cells for MHC class II signaling when the bone marrow cells are exposed to the adjuvant indicates that the adjuvant is useful for enhancing thymus-dependent immune responses.

38. The method of Claim 36, wherein step (a) is performed *in vivo* by administering the test adjuvant to an animal and isolating bone marrow cells, stem cells, or spleen cells from the animal prior to performing step (b).

39. The method of Claim 38, wherein the test adjuvant is administered together with an antigen.

40. The method of Claim 37, wherein step (a) is performed *in vitro* by exposing the cells to the test adjuvant in a culture.

41. The method of Claim 37, wherein the myeloid progenitor cells are selected from the group consisting of: bone marrow cells, adult stem cells, fetal stem cells, embryonic stem cells, hematopoietic precursor cells, spleen cells, peripheral blood cells, a direct progenitor of the myeloid cell according to Claim 1.